

Composting EF Summary

Source Test	Investigator	Site	Date	Material	Process	NH ₃ Emissions		VOC Emissions		CH ₄ Emissions		Emissions Test Methods
						lb/ton	lb/hr-1,000 ft ²	lb/ton	lb/hr-1,000 ft ²	lb/ton	lb/hr-1,000 ft ²	
SCAQMD 1996	Willoughby, SCAQMD	EKO Systems, Corona CA	Nov 1995 & Jan 1996	20% digested biosolids + 80% manure	Windrow - Day 2		0.245		0.143		0.14	US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.1 for VOC reported as Total Gaseous Non-Methane Organic Compounds (TGNMOC) & methane. Also measured amine and organic sulfur compounds.
					Windrow - Day 20		0.058		0.022		0.122	
					Windrow - Day 50		0.223		0.106		0.094	
					Windrow - Total	3.28	0.175	1.7	0.09	2.23	0.119	
SCAQMD 1996	Willoughby, SCAQMD	San Joaquin Composting, Lost Hills CA	Feb-Mar 1996	50% dewatered biosolids + 50% green waste	Windrow - Day 3		0.155		0.329		3.65	US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.1 for VOC reported as Total Gaseous Non-Methane Organic Compounds (TGNMOC) & methane. Also measured amine and organic sulfur compounds. Rain event prior to day 3.
					Windrow - Day 45		0.146		0.0123		0.0114	
					Windrow - Day 57		0.0197		<0.0127		<.0143	
					Windrow - Total	2.81	0.107	3.12	0.11	33.49	1.23	
SCAQMD 1996	Willoughby, SCAQMD	Rancho Las Virgenes Municipal Water District	Dec. 1995	dewatered biosolids + wood chips	In-vessel, biofilter inlet	0.7	0.036	0.76	0.038	0.5	0.025	Samples sampled directly from the biofilter inlet. SCAQMD Method 207.1 for ammonia and SCAQMD 25.1 for VOC reported as Total Gaseous Non-Methane Organic Compounds (TGNMOC).
SCAQMD 2001	Stredwick, SCAQMD	Inland Empire Composting, Colton CA	Sept. - Oct. 2001	100% green waste	Tipping pile		0.091		0.368		0.079	US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.3 for VOC. 2 day old pile.
					Static, fines and ADC piles		0.071		0.226		0.024	US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.3 for VOC. 7 days in static pile, 9-14 days at facility.
					Windrows		0.004		0.079		0.005	US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.3 for VOC. 7 and 30 days in windrow, 40-45 & 65-70 days at facility.
					Entire Facility	1.32		5.05		0.83		US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.3 for VOC.
SCAQMD 2001	Wang, SCAQMD	Inland Empire Composting, Colton CA	Nov. - Dec. 2001	100% green waste	Tipping pile		0.018		0.28			Remote sensing Boreal Laser for ammonia and methane. Used flux chamber results to correlate VOC to methane.
					Static, fines and ADC piles		0.048		0.21			Remote sensing Boreal Laser for ammonia and methane. Used flux chamber results to correlate VOC to methane.
					Windrow		0.004		0.079			Did not measure windrows. Used previous source test data.
					Entire Facility	0.32	0.022	2.47	0.17			Uses windrow emissions from first ("summer") test.
CIWMB 2002	Smythe & Schmidt	Van Norman Chip/Grind Facility, San Fernando Valley CA	Dec. 2001	50% yard waste + 50% brush & logs	Raw green pile		nd		0.031		0.0022	US EPA flux chamber and NMAM 6015 for ammonia and USEPA Method 25C for VOC. High winds.
					Coarse pile		0.00013		0.48		0.0008	
					Fine pile		nd		0.27		0.0004	
					Super fine pile		0.00012		0.43		0.0004	
		LACSD Scholl Canyon Landfill Chip/Grind Facility, Glendale CA		ADC coarse mulch			0.0017		3.2			US EPA flux chamber and NMAM 6015 for ammonia and USEPA Method 25C for VOC. Measured after times 0, 1, 8, 24, 48 and 72 hours. Highest average hourly flux reported.
		Anchorage Site, San Pedro Harbor CA	Dec. 2001	100% yard waste	Windrows		0.0035		0.098		1.8	US EPA flux chamber and NMAM 6015 for ammonia and USEPA Method 25C for VOC. Measurements taken on days 1, 3, 7, 14 and 28 on disturbed and undisturbed piles.
		Inland Empire, Colton CA	Dec. 2001	80% yard waste + 20% wood waste	Tipping pile		0.0056		nd		nd	US EPA flux chamber and NMAM 6015 for ammonia and USEPA Method 25C for VOC. VOC values multiplied by a 1.16 as a correction factor based on measurements correlating SCAQMD 25.3 with USEPA 25C.

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						lb/ton	lb/hr-1,000 ft ²	lb/ton	lb/hr-1,000 ft ²	lb/ton	lb/hr-1,000 ft ²	
					17-day pile		0.0076		0.027		0.023	
					45-day pile		0.0013		0.0012		0.024	
					90-day pile		0.0028		0.3		0.48	
					Fines		0.00052		0.105		0.051	
Yolo-Solano AQMD 2005	Card & Schmidt	Jepson Prairie Organics, Vacaville CA	Aug. 2005	Food waste	Feedstock	0.0004		0.09				US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.3 for VOC.
					Ag Bag In-Vessel	0.05		3.06				US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.3 for VOC. Measured bag outlets on days 1, 4, 5, 8, 10, 22 & 30.
					Ag Bag Curing	0.67		33.62				US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.3 for VOC. Measured curing pile on days 0, 1, 3, 5, 7, 13, 19 & 25 after bag removal.
					Final Product	0.01		0.24				US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.3 for VOC. Measured 90 day old final product.
				Green waste	Feedstock	0.07		2.95				US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.3 for VOC.
					Windrow	0.24		5.65				US EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD 25.3 for VOC. Measured bag outlets on days 1, 3, 6, 7, 15, 30 & 50.
CIWMB 2007	Buyuksonmez & Schmidt	Modesto Compost, Modesto CA	Oct. - Dec. 2006	Residential/Municipal green waste	Windrow			0.8 - 0.9				US EPA flux chamber and SCAQMD 25.3 for VOC. Measured on days 1, 2, 3, 6, 8, 14, 21, 30, 44 & 57.
				15% Residential food waste + 85% green waste	Windrow			1.3 - 2.6				
				Green waste with finished compost cover	Windrow			0.1 - 0.4				Only includes first 2 weeks emissions
LACSD 2007	Card & Schmidt	Cedar Grove Composting, Everett WA	Jan. - Mar. 2007	37% biosolids + 63% ag green waste	ASP Uncontrolled (under Gore cover)	4.02		2.12				Used EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD Method 25.3 for VOC. Freezing weather conditions, inadequate pile mixing. Measured on days 2, 4, 7, 14, 28, 30, 44 & 47
					ASP Gore Cover	1.79		0.2				
SWCAA 2005	???	Little Hanaford Farms, WA	Aug. 2004	Solid waste	Active composting	0.0654		0.1				No data on test methods.
					Curing composting	0.0164		0.025				
CIWMB 2003	Smythe and Schmidt	Tierra Verde Industries, Irvine CA	Oct. 2002	Green waste, grass clippings	Static pile		nd		0.078			Used EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD Method 25.3 for VOC. Freezing weather conditions, inadequate pile mixing. Measured on days 3 & 11.
				Green waste, grass clippings	Turned windrow		nd		0.929			Measured on days 4 & 12.
				Woody waste	Static pile		nd		0.047			Measured on days 3 & 11.
				Woody waste	Turned windrow		nd		0.323			Measured on days 4 & 12.
SCAQMD 2002	Wang, SCAQMD	Intravia Rock & Sand Inc., Upland CA	Jul. 2002	Chip & grind woody waste	Tipping pile		0.003		0.228		0.0029	Used EPA flux chamber. Method of analyzing pollutants not given.
					Ground piles		0.0006		0.153		0.0097	
					Facility total	0.017		1.5		0.058		
LACSD, 2005	Card & Schmidt	Westlake Farms, Stratford, CA	Mar. 2005	Bulking agent - shredded almond wood	Stockpile		0.0000079				0.0007	Used EPA flux chamber and SCAQMD Method 207.1 for ammonia and SCAQMD Method 25.3 for VOC. VOC reported as methane. Most measurements at or below detection limit, therefore emission factor estimates based on 50% of practical quantification limit.